

CLAIMS

1. A surface-mounting substrate for mounting a part thereon, which comprises a core substrate, a plurality of layers of patterned wiring lines, which are separated from each other by an insulation layer interposed therebetween, vias piercing through the insulation layer to connect the wiring lines at the adjacent layers to each other, and a layer of connecting terminals to mount a part on the surface-mounting substrate, each of the connecting terminals connecting with the wiring line at the outermost layer of wiring lines, wherein the connecting terminal is filled in an outermost insulation layer provided at the surface of the surface-mounting substrate, and has a surface exposed at substantially the same level as the level of the surface of the outermost insulation layer.

2. The surface-mounting substrate of claim 1, which is provided on the surface of each of the connecting terminals with a conductor material.

3. The surface-mounting substrate of claim 2, wherein the conductor material is solder.

4. The surface-mounting substrate of claim 1, wherein the part to be mounted is a semiconductor device.

5. The surface-mounting substrate of claim 1, wherein the layer of the connecting terminals is separated from the outermost layer of wiring lines by an insulation layer interposed therebetween, and the connecting terminal is connected with the wiring line at the outermost layer of wiring lines through a via piercing through the insulation layer separating the layer of the connecting terminals from the outermost layer of wiring lines.

6. The surface-mounting substrate of claim 1, wherein the connecting terminal is directly connected with the wiring line at the outermost layer of wiring lines located under the layer of connecting terminals.

7. The surface-mounting substrate of claim 1,

wherein the connecting terminal is directly connected with the wiring line at the outermost layer in the surface-mounting substrate, and the wiring lines at the outermost layer are covered with a cover material.

5 8. The surface-mounting substrate of claim 7, wherein the cover material is a solder resist.

10 9. The surface-mounting substrate of claim 1, wherein the connecting terminals are arranged at a pitch of 100 micrometers or smaller and at a spacing distance of 20 micrometer or larger.

15 10. The surface-mounting substrate of claim 1, wherein conductive members in an area, over which the part is mounted, of the outermost layer of wiring lines connected with the connecting terminals are arranged at a uniform density as a whole.

11. The surface-mounting substrate of claim 10, wherein the conductive members include the wiring lines and the connecting terminals.

20 12. The surface-mounting substrate of claim 1, wherein conductive members in the area, over which the part is mounted, of each of the layers of wiring lines located below the outermost layer of wiring lines connected with the connecting terminals are arranged at a uniform density as a whole.

25 13. The surface-mounting substrate of claim 12, wherein the conductive members include the wiring lines and the vias.

30 14. The surface-mounting substrate of claim 13, wherein the conductive members further include a power supply plane and/or a grounding plane.

35 15. The surface-mounting substrate of claim 10, wherein the conductive members at each of the layers of wiring lines below the outermost layer of wiring lines are arranged at substantially the same density as the density of conductive members at the outermost wiring lines.

16. The surface-mounting substrate of claim 10,

which has dummy members at at least one of layers of wiring lines.

5 17. The surface-mounting substrate of claim 12, which has dummy members at at least one of layers of wiring lines.

18. The surface-mounting substrate of claim 14, wherein the power supply plane and/or the grounding plane is in a mesh-like shape or has slits.

10 19. The surface-mounting substrate of claim 10, wherein the wiring lines have a width of 20 to 200 micrometers, and are arranged at a pitch of 60 to 300 micrometers.

15 20. The surface-mounting substrate of claim 12, wherein the wiring lines have a width of 20 to 200 micrometers, and are arranged at a pitch of 60 to 300 micrometers.

21. The surface-mounting substrate of claim 10, wherein the vias have a diameter of 0.05 to 0.6 millimeter.

20 22. The surface-mounting substrate of claim 12, wherein the vias have a diameter of 0.05 to 0.6 millimeter.

25 23. The surface-mounting substrate of claim 10, wherein the core substrate has through holes to connect a wiring line at one side of the substrate to another wiring line at the other side, the through holes having a diameter of 0.2 to 0.6 millimeter, and being arranged in a pitch of 0.5 to 1.5 millimeters.

30 24. The surface-mounting substrate of claim 12, wherein the core substrate has through holes to connect a wiring line at one side of the substrate to another wiring line at the other side, the through holes having a diameter of 0.2 to 0.6 millimeter, and being arranged in a pitch of 0.5 to 1.5 millimeters.

35 25. A surface-mounting substrate for mounting a part thereon, which comprises a core substrate, a plurality of layers of patterned wiring lines, which are

separated from each other by an insulation layer interposed therebetween, vias piercing through the insulation layer to connect the wiring lines at the adjacent layers to each other, and a layer of connecting terminals to mount a part on the surface-mounting substrate, wherein conductive members in an area, over which the part is mounted, of an outermost layer of wiring lines are arranged at a uniform density as a whole.

10 26. The surface-mounting substrate of claim 25, wherein the conductive members include the wiring lines and the connecting terminals.

15 27. The surface-mounting substrate of claim 25, wherein conductive members in the area, over which the part is mounted, of each of the layers of wiring lines located below the outermost layer of wiring lines are arranged at a uniform density as a whole.

20 28. The surface-mounting substrate of claim 27, wherein the conductive members include the wiring lines and the vias.

25 29. The surface-mounting substrate of claim 28, wherein the conductive members further include a power supply plane and/or a grounding plane.

30 30. The surface-mounting substrate of claim 25, wherein the conductive members at each of the layers of wiring lines below the outermost layer of wiring lines are arranged at substantially the same density as the density of conductive members at the outermost wiring lines.

35 31. The surface-mounting substrate of claim 25, which has dummy members at at least one of layers of wiring lines.

35 32. The surface-mounting substrate of claim 27, which has dummy members at at least one of layers of wiring lines.

35 33. The surface-mounting substrate of claim 29, wherein the power supply plane and/or the grounding plane

is in a mesh-like shape or has slits.

34. The surface-mounting substrate of claim 25, wherein the wiring lines have a width of 20 to 200 micrometers, and are arranged at a pitch of 60 to 300 micrometers.

35. The surface-mounting substrate of claim 27, wherein the wiring lines have a width of 20 to 200 micrometers, and are arranged at a pitch of 60 to 300 micrometers.

10 36. The surface-mounting substrate of claim 25, wherein the vias have a diameter of 0.05 to 0.6 millimeter.

15 37. The surface-mounting substrate of claim 27, wherein the vias have a diameter of 0.05 to 0.6 millimeter.

20 38. The surface-mounting substrate of claim 25, wherein the core substrate has through holes to connect a wiring line at one side of the substrate to another wiring line at the other side, the through holes having a diameter of 0.2 to 0.6 millimeter, and being arranged in a pitch of 0.5 to 1.5 millimeters.

25 39. The surface-mounting substrate of claim 27, wherein the core substrate has through holes to connect a wiring line at one side of the substrate to another wiring line at the other side, the through holes having a diameter of 0.2 to 0.6 millimeter, and being arranged in a pitch of 0.5 to 1.5 millimeters.

30 40. A structure comprising a surface-mounting substrate and a part mounted thereon, the surface-mounting substrate comprising a core substrate, a plurality of layers of patterned wiring lines, which are separated from each other by an insulation layer interposed therebetween, vias piercing through the insulation layer to connect the wiring lines at the adjacent layers to each other, and a layer of connecting terminals to mount the part on the surface-mounting substrate, each of connecting terminals connecting with

the wiring line at the outermost layer of wiring lines, and the part having bumps, and being mounted on the substrate through the bumps bonded to the respective connecting terminals, wherein the connecting terminal of the surface-mounting substrate is filled in an outermost insulation layer provided at the surface of the surface-mounting substrate, and has a surface exposed at substantially the same level as the level of the surface of the outermost insulation layer.

10 41. The structure of claim 40, wherein the part to be mounted is a semiconductor device.

15 42. The structure of claim 40, wherein conductive members in an area, over which the part is mounted, of the outermost layer of wiring lines connected with the connecting terminals are arranged at a uniform density as a whole.

20 43. The structure of claim 42, wherein the conductive members include the wiring lines and the connecting terminals.

25 44. The structure of claim 40, wherein conductive members in the area, over which the part is mounted, of each of the layers of wiring lines located below the outermost layer of wiring lines connected with the connecting terminals are arranged at a uniform density as a whole.

30 45. The structure of claim 44, wherein the conductive members include the wiring lines and the vias.

35 46. The structure of claim 42, wherein the conductive members at each of the layers of wiring lines below the outermost layer of wiring lines are arranged at substantially the same density as the density of conductive members at the outermost wiring lines.

47. A structure comprising a surface-mounting substrate and a part mounted thereon, the surface-mounting substrate comprising a core substrate, a plurality of layers of patterned wiring lines, which are separated from each other by an insulation layer

interposed therebetween, vias piercing through the insulation layer to connect the wiring lines at the adjacent layers to each other, and a layer of connecting terminals to mount a part on the surface-mounting
5 substrate, wherein conductive members in an area, over which the part is mounted, of an outermost layer of wiring lines are arranged at a uniform density as a whole.

10 48. The structure of claim 47, wherein the part to be mounted is a semiconductor device.

49. The structure of claim 47, wherein the conductive members include the wiring lines and the connecting terminals.

15 50. The structure of claim 47, wherein conductive members in the area, over which the part is mounted, of each of the layers of wiring lines located below the outermost layer of wiring lines are arranged at a uniform density as a whole.

20 51. The structure of claim 50, wherein the conductive members include the wiring lines and the vias.

25 52. The structure of claim 47, wherein the conductive members at each of the layers of wiring lines below the outermost layer of wiring lines are arranged at substantially the same density as the density of conductive members at the outermost wiring lines.